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METHOD FOR SEPARATING AND PROCESSING SIGNAL AND BEARER IN ALL IP RADIO ACCESS NETWORK

Field of the Invention

This invention relates to an ALL IP radio access network; and more particularly, to a method for separating and processing a signal and a bearer in an ALL IP radio access network.

Description of the prior Art

These days, it is under detail discussion at international standardization conferences, a 3GPP and a 3GPP2 conferences, that an whole network of a 3G system is to be configured with an ALL IP network based on an IP (IP = internet protocol).

The ALL IP network is researched based on a mobile IP of an IETF (IETF = international engineering task force). In the mobile IP case, a two-tier address system is adopted for an address conversion technique at an IP layer. In other words, a first address is a COA (COA = care-of address) that is used for a path assignment and a transferring manner. A second address is a home address that is a unique home address of a mobile host and is used for identifying the mobile host and for session connection.

A unique internet address called a home address is

assigned to a mobile station for the ALL IP, wherein the unique internet address corresponds to a host name like an existing fixed host. Also, the mobile station for the ALL IP has an COA (care-of address) as a packet transfer point, wherein the COA gets changed as the mobile station for the ALL IP moves between networks. At the present time, the IETF defines three components for a mobile IP service such as a mobile node, a HA (HA = home agent) and a FA (FA = foreign agent) as follows.

The mobile node is operated as a host or router that supports a mobile service. The mobile node is able to move between networks without modifying an IP address thereof and also communicate continuously with other nodes of the internet by a fixed IP address thereof.

The HA (home agent) is an agent included in a home network of a mobile node, wherein the home network manages a current COA (care-of address) and a home address of the mobile node. The HA (home agent) performs a tunneling function in order to transfer a datagram of the mobile node to a network in which the mobile node is currently included when the mobile node is in an external network.

The FA (foreign agent) is an agent assigning the COA (care-of address) when the mobile node is in the external network. The FA can assign an IP address of thereof as a COA or a temporary IP address of the mobile node. The FA provides a routing service for any mobile node when the mobile node moves in a service area covered by the FA. After performing a

detunneling function on a datagram that was tunnel-functioned and receives from a HA of the mobile node, the FA transfers the datagram to the mobile node. In this case, the FA provides an existing gateway service for the datagram transmitted from the mobile node.

A standard model being processed at an ALL IP Adhoc defines an IPMM (IPMM = IP multi-media) domain and an ANSI-41 domain (ANSI = American National Standards institute) for a core network. Here, the IPMM domain is used for a packet service and the ANSI-41 domain is used for an existing circuit service. Protocols for the IPMM domain are based on a mobile IP, a SIP or the like. Protocols for the ANSI-41 domain are based on an IS-2000, an IOS, an ANSI-41 or the like.

According to a model being currently processed, one same entity performs processing of a signal and a bearer in a radio network as shown in Fig. 1. However, this model can be unsuitable for development into an open type structure.

Currently, a message that a mobile station sends to request a connection is transmitted to a MSC (MSC = mobile switching center) via a BSC (BSC = base station controller) in an IS-2000. A currently operating BSC includes one entity for controlling a call-related signal and a bearer of user data and for providing a path.

As a currently operating network evolves into an ALL IP network, it is required to control and manage a new service and new user data. To do so, a core network is classified into the ANSI-41 domain for the existing service and the IPMM (IP

multi-media) domain. The IPMM domain provides the new service and an internet-based service.

Accordingly, it is required to configure the BSC including a signal-related entity and a bearer-related entity to process the signal and the bearer separately.

Summary of the Invention

It is an object of the present invention to provide a method for a method for separating and processing a signal and a bearer in an ALL IP radio access network and computer-readable record media storing instructions for performing the method to perform a flexible configuration of a radio network based on an IP.

In accordance with an aspect of the present invention, there is provided a method for processing a signal and a bearer separately in an ALL IP network system including one or mobile stations, one or more radio networks and one or more core network, the method including the steps of: transmitting a service request message from the mobile station to the radio network; at the radio network, determining whether a circuit-related service or a packet-related service is requested; if the packet-related service is requested, transmitting the service request message from the radio network to the core network without performing any process of the service request message; at the core network, performing a process of the service request message and requesting the radio network to

assign the bearer for user data; and assigning the bearer in response to the assignment request.

Brief Description of the Drawings

Other objects and aspects of the invention will become apparent from the following description of the embodiments with reference to the accompanying drawings, in which:

Fig. 1 shows a configuration of an ALL IP network;

Fig. 2 shows a configuration of a radio network in which a signal and a bearer are separated in accordance with the present invention;

Fig. 3 shows a configuration of an ALL IP network including a radio access network (RAN) shown in Fig. 2;

Fig. 4 shows a signaling message flow for a packet service;

Fig. 5 shows a signaling message flow for a circuit service; and

Fig. 6 is a flow chart illustrating a method for separating and processing a signal and a bearer in an ALL IP radio access network in accordance with the present invention.

Detailed Description of the Preferred Embodiments

Fig. 2 shows a configuration of a radio network in which a signal and a bearer are separated.

As shown in Fig. 2, a RAN (RAN = radio access network)

includes a first entity for processing a signal or the like, a second entity for providing a path related to a user data process and a base transceiver station (BTS) that is directly coupled to a mobile station (MS).

Fig. 3 is a schematic diagram illustrating an ALL IP network including a radio access network (RAN) shown in Fig. 2.

Fig. 4 shows a signaling message flow for a packet service.

Fig. 5 shows a signaling message flow for a circuit service.

Referring to Figs. 4 and 5, the mobile station performs a signaling suitable for the packet or the circuit services in order to transmit user data. A RNCS (RNCS = radio network control system) of a RAN (radio access network) performs a corresponding function in response to a request of the mobile station. Here, the mobile station is assumed to be a dual mode mobile station where an existing circuit and a packet services are possible to provide.

Fig. 6 is a flow chart illustrating a method for separating and processing a signal and a bearer in an ALL IP radio access network in accordance with the present invention.

At the step S10, a service request of a user is received in a message form from a mobile station.

At the step S20, a RNCS (radio network control system) of a RAN (radio access network) determines whether a first message related to a circuit service or a second message related to a packet service is received.

There are a plurality of manners for service determination. Herein is provided a manner for the determination using an address of a TCP/IP header. In other words, since the packet service is transmitted to a session manager of a core network, the address of the TCP/IP header has an address of the session manager. On the contrary, since the circuit service is transmitted to a MSC (MSC = mobile switching center) server of the core network, the address of the TCP/IP header has an address of the MSC server.

If the first message is received, at the step S30, the RNCS of the RAN transmits a CM service request message to the MSC server, wherein the CM service request message is generated in an IOS message form.

At the step S40, the MSC receives and processes the CM service request message and then transmits a CM service request Ack message to the RNCS.

At the step S50, after receiving the CM service request Ack message, the RNCS transmits an assignment request message to the mobile station in order to assign a radio channel and then transmits a bearer assignment request message to a RBF unit (RBF = radio bearer function) in order to assign a bearer for transmitting user data.

If the second message is received, at the step S60, the RNCS transmits the second message to the session manager of the core network without any message processing.

At the step S70, the session manager or a resource manager of the core network processes the second message and

then requests the RNCS to assign the bearer in order to assign a bearer for processing the user data.

At the step S80, the RNCS transmits a response message related to service request to the mobile station and then transmits the bearer assignment request message to the RBF unit in order to assign the bearer for transmitting the user data.

At the step S90, after receiving the bearer assignment request message from the RNCS, the RBF assigns the bearer.

In accordance with the present invention, there is an effect that a signal and a bearer are separated and processed in a RAN system of an ALL IP network to thereby facilitate network configuration of an open type structure, increase extension capability of each system and perform a flexible configuration of a network based on an IP.

Although the preferred embodiments of the invention have been disclosed for illustrative purpose, those skilled in the art will appreciate that various modifications, additions, and substitutions are possible, without departing from the scope and sprit of the invention as disclosed in the accompanying claims.